

CLAIMS

1. A chimeric receptor protein comprising a single polypeptide chain of amino acids, said protein comprising, in N-terminal to C-terminal order and immediately adjacent to each other and without further intervening amino acids, the following amino acid

5 sequence domains:

- a) an NPY5 receptor N-terminal extracellular domain,
- b) an NPY5 receptor first transmembrane domain,
- c) an NPY5 receptor first intracellular loop domain,
- d) an NPY5 receptor second transmembrane domain,
- 10 e) an NPY5 receptor first extracellular loop domain,
- f) an NPY5 receptor third transmembrane domain,
- g) an NPY5 receptor second intracellular loop domain,
- h) an NPY5 receptor fourth transmembrane domain,
- i) an NPY5 receptor second extracellular loop domain,
- 15 j) an NPY receptor fifth transmembrane domain,
- k) an NPY1 receptor third intracellular loop domain,
- l) an NPY receptor sixth transmembrane domain,
- m) an NPY5 receptor third extracellular loop domain,
- n) an NPY5 receptor seventh transmembrane domain, and
- 20 o) an NPY5 receptor C-terminal intracellular domain.

2. A chimeric receptor protein according to claim 1, in which the NPY receptor of the fifth transmembrane domain and the sixth transmembrane domain are selected from NPY1 and NPY5 receptors.

3. A chimeric receptor protein according to claim 1, in which each domain is  
25 independently selected from human, monkey, dog, mouse, pig, guinea pig, and rat receptors.

4. A chimeric receptor protein comprising a single polypeptide chain of amino acids, said protein comprising, in N-terminal to C-terminal order and immediately adjacent to each other and without further intervening amino acids, the following amino acid

30 sequence domains:

- a) an NPY5 receptor N-terminal extracellular domain,
- b) an NPY5 receptor first transmembrane domain,

- c) an NPY5 receptor first intracellular loop domain,
  - d) an NPY5 receptor second transmembrane domain,
  - e) an NPY5 receptor first extracellular loop domain,
  - f) an NPY5 receptor third transmembrane domain,
  - 5 g) an NPY5 receptor second intracellular loop domain,
  - h) an NPY5 receptor fourth transmembrane domain,
  - i) an NPY5 receptor second extracellular loop domain,
  - j) an NPY5 receptor fifth transmembrane domain,
  - k) an NPY5 receptor third intracellular loop domain,
  - 10 l) an NPY5 receptor sixth transmembrane domain,
  - m) an NPY5 receptor third extracellular loop domain,
  - n) an NPY receptor seventh transmembrane domain, and
  - o) an NPY1 receptor C-terminal intracellular domain.
5. A chimeric receptor protein according to claim 4, in which the NPY receptor of
- 15 the fifth transmembrane domain and the sixth transmembrane domain are selected from NPY1 and NPY5 receptors.
6. A chimeric receptor protein according to claim 4, in which each domain is independently selected from human, monkey, dog, mouse, pig, guinea pig, and rat receptors.
- 20 7. A chimeric receptor protein comprising a single polypeptide chain of amino acids, said protein comprising, in N-terminal to C-terminal order and immediately adjacent to each other and without further intervening amino acids, the following amino acid sequence domains:
- a) an NPY5 receptor N-terminal extracellular domain,
  - 25 b) an NPY5 receptor first transmembrane domain,
  - c) an NPY5 receptor first intracellular loop domain,
  - d) an NPY5 receptor second transmembrane domain,
  - e) an NPY5 receptor first extracellular loop domain,
  - f) an NPY5 receptor third transmembrane domain,
  - 30 g) an NPY5 receptor second intracellular loop domain,
  - h) an NPY5 receptor fourth transmembrane domain,
  - i) an NPY5 receptor second extracellular loop domain,

- j) an NPY receptor fifth transmembrane domain,  
k) an NPY1 receptor third intracellular loop domain,  
l) an NPY receptor sixth transmembrane domain,  
m) an NPY5 receptor third extracellular loop domain,  
5 n) an NPY receptor seventh transmembrane domain, and  
o) an NPY1 receptor C-terminal intracellular domain.
8. A chimeric receptor protein according to claim 7, in which the NPY receptor of the fifth transmembrane domain and the sixth transmembrane domain are selected from NPY1 and NPY5 receptors.
- 10 9. A chimeric receptor protein according to claim 7, in which each domain is independently selected from human, monkey, dog, mouse, pig, guinea pig, and rat receptors.
10. An isolated polynucleotide encoding a polypeptide comprising the chimeric receptor protein of claim 1, the receptor protein consisting of the amino acid sequence of  
15 SEQ. ID NO. 6, or a fragment of said sequence capable of binding a signal transducing ligand for said receptor protein.
11. An isolated polynucleotide encoding a polypeptide comprising the chimeric receptor protein of claim 4, the receptor protein consisting of the amino acid sequence of  
20 SEQ. ID NO. 9, or a fragment of said sequence capable of binding a signal transducing ligand for said receptor protein.
12. An isolated polynucleotide encoding a polypeptide comprising the chimeric receptor protein of claim 7, the receptor protein consisting of the amino acid sequence of  
SEQ. ID NO. 10, or a fragment of said sequence capable of binding a signal transducing ligand for said receptor protein.
- 25 13. A nucleic acid molecule encoding the protein of claim 1.  
14. A nucleic acid molecule encoding the protein of claim 4.  
15. A nucleic acid molecule encoding the protein of claim 7.  
16. An isolated polynucleotide encoding a chimeric receptor protein according to claim 1, the polynucleotide consisting of SEQ. ID. NO. 5 and homologues thereof or a  
30 polynucleotide which hybridizes to the complement of SEQ. ID. NO. 5.

17. An isolated polynucleotide encoding a chimeric receptor protein according to claim 4, the polynucleotide consisting of SEQ. ID. NO. 7 and homologues thereof or a polynucleotide which hybridizes to the complement of SEQ. ID. NO. 7.
18. An isolated polynucleotide encoding a chimeric receptor protein according to claim 7, the polynucleotide consisting of SEQ. ID. NO. 8 and homologues thereof or a polynucleotide which hybridizes to the complement of SEQ. ID. NO. 8.
19. A vector for recombinant expression of a chimeric receptor protein, said vector comprising the nucleic acid molecule of claim 13, operatively linked to at least one regulatory element in the appropriate orientation for expression.
20. A vector for recombinant expression of a chimeric receptor protein, said vector comprising the nucleic acid molecule of claim 14, operatively linked to at least one regulatory element in the appropriate orientation for expression.
21. A vector for recombinant expression of a chimeric receptor protein, said vector comprising the nucleic acid molecule of claim 15, operatively linked to at least one regulatory element in the appropriate orientation for expression.
22. A vector for recombinant expression of a chimeric receptor protein, said vector comprising the polynucleotide of claim 16, operatively linked to at least one regulatory element in the appropriate orientation for expression.
23. A vector for recombinant expression of a chimeric receptor protein, said vector comprising the polynucleotide of claim 17, operatively linked to at least one regulatory element in the appropriate orientation for expression.
24. A vector for recombinant expression of a chimeric receptor protein, said vector comprising the polynucleotide of claim 18, operatively linked to at least one regulatory element in the appropriate orientation for expression.
25. The vector of claim 19, wherein the vector is a plasmid vector.
26. The vector of claim 20, wherein the vector is a plasmid vector.
27. The vector of claim 21, wherein the vector is a plasmid vector.
28. The vector of claim 22, wherein the vector is a plasmid vector.
29. The vector of claim 23, wherein the vector is a plasmid vector.
30. The vector of claim 24, wherein the vector is a plasmid vector.
31. The vector of claim 19, wherein the vector is a viral vector.
32. The vector of claim 20, wherein the vector is a viral vector.

33. The vector of claim 21, wherein the vector is a viral vector.
34. The vector of claim 22, wherein the vector is a viral vector.
35. The vector of claim 23, wherein the vector is a viral vector.
36. The vector of claim 24, wherein the vector is a viral vector.
- 5 37. A recombinant cell comprising the vector of claim 19, said recombinant cell being prepared by introducing said vector into a host cell not containing said vector to generate a vector-containing cell containing said vector, wherein the recombinant cell is the vector-containing cell or its progeny.
38. A recombinant cell comprising the vector of claim 20, said recombinant cell being  
10 prepared by introducing said vector into a host cell not containing said vector to generate a vector-containing cell containing said vector, wherein the recombinant cell is the vector-containing cell or its progeny.
39. A recombinant cell comprising the vector of claim 21, said recombinant cell being prepared by introducing said vector into a host cell not containing said vector to generate  
15 a vector-containing cell containing said vector, wherein the recombinant cell is the vector-containing cell or its progeny.
40. A recombinant cell comprising the vector of claim 22, said recombinant cell being prepared by introducing said vector into a host cell not containing said vector to generate a vector-containing cell containing said vector, wherein the recombinant cell is the  
20 vector-containing cell or its progeny.
41. A recombinant cell comprising the vector of claim 23, said recombinant cell being prepared by introducing said vector into a host cell not containing said vector to generate a vector-containing cell containing said vector, wherein the recombinant cell is the vector-containing cell or its progeny.
- 25 42. A recombinant cell comprising the vector of claim 24, said recombinant cell being prepared by introducing said vector into a host cell not containing said vector to generate a vector-containing cell containing said vector, wherein the recombinant cell is the vector-containing cell or its progeny.
43. The recombinant cell of claim 37, wherein the recombinant cell exhibits  
30 neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by the host cell.

44. The recombinant cell of claim 38, wherein the recombinant cell exhibits neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by the host cell.
45. The recombinant cell of claim 39, wherein the recombinant cell exhibits neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by the host cell.
46. The recombinant cell of claim 40, wherein the recombinant cell exhibits neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by the host cell.
47. The recombinant cell of claim 41, wherein the recombinant cell exhibits neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by the host cell.
48. The recombinant cell of claim 42, wherein the recombinant cell exhibits neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by the host cell.
49. The recombinant cell of claim 43, wherein the host cell is an insect cell.
50. The recombinant cell of claim 44, wherein the host cell is an insect cell.
51. The recombinant cell of claim 45, wherein the host cell is an insect cell.
52. The recombinant cell of claim 46, wherein the host cell is an insect cell.
53. The recombinant cell of claim 47, wherein the host cell is an insect cell.
54. The recombinant cell of claim 48, wherein the host cell is an insect cell.
55. The recombinant cell of claim 43, wherein the host cell is a mammalian cell.
56. The recombinant cell of claim 44, wherein the host cell is a mammalian cell.
57. The recombinant cell of claim 45, wherein the host cell is a mammalian cell.
58. The recombinant cell of claim 46, wherein the host cell is a mammalian cell.
59. The recombinant cell of claim 47, wherein the host cell is a mammalian cell.
60. The recombinant cell of claim 48, wherein the host cell is a mammalian cell.
61. An amphibian oocyte comprising an RNA which is the nucleic acid molecule of claim 13.
62. An amphibian oocyte comprising an RNA which is the nucleic acid molecule of claim 14.

63. An amphibian oocyte comprising an RNA which is the nucleic acid molecule of claim 15.
64. An amphibian oocyte comprising an RNA which is the polynucleotide of claim 16.
65. An amphibian oocyte comprising an RNA which is the polynucleotide of claim 17.
66. An amphibian oocyte comprising an RNA which is the polynucleotide of claim 18.
67. A preparation of recombinant membranes isolated from a plurality of the recombinant cell of claim 43, wherein the recombinant membranes of the preparation exhibit neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by a control consisting of a matched preparation of membranes isolated from host cells.
68. A preparation of recombinant membranes isolated from a plurality of the recombinant cell of claim 44, wherein the recombinant membranes of the preparation exhibit neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by a control consisting of a matched preparation of membranes isolated from host cells.
69. A preparation of recombinant membranes isolated from a plurality of the recombinant cell of claim 45, wherein the recombinant membranes of the preparation exhibit neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by a control consisting of a matched preparation of membranes isolated from host cells.
70. A preparation of recombinant membranes isolated from a plurality of the recombinant cell of claim 46, wherein the recombinant membranes of the preparation exhibit neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by a control consisting of a matched preparation of membranes isolated from host cells.
71. A preparation of recombinant membranes isolated from a plurality of the recombinant cell of claim 47, wherein the recombinant membranes of the preparation exhibit neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by a control consisting of a matched preparation of membranes isolated from host cells.
72. A preparation of recombinant membranes isolated from a plurality of the recombinant cell of claim 48, wherein the recombinant membranes of the preparation exhibit neuropeptide Y binding activity that is at least 2-fold greater than that exhibited by a control consisting of a matched preparation of membranes isolated from host cells.

74. An assay for characterizing a test compound, said assay comprising contacting a chimeric receptor of claim 4, with the test compound and detecting a consequence of the binding of said test compound to said receptor.

76. The assay of claim 73, wherein the test compound is unlabeled and the consequence is the displacement from the receptor of a labeled compound that binds specifically to the receptor.

78. The assay of claim 75, wherein the test compound is unlabeled and the consequence is the displacement from the receptor of a labeled compound that binds specifically to the receptor.

80. The assay of claim 74, wherein the receptor is a membrane-inserted receptor and the consequence is a response associated with at least one intracellular domain of the receptor.

81. The assay of claim 75, wherein the receptor is a membrane-inserted receptor and the consequence is a response associated with at least one intracellular domain of the receptor.

82. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomotor disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 73.



83. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomoter disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 74.

84. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomoter disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 75.

85. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomoter disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 76.

86. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomoter disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 77.

87. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomoter disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 78.

88. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomoter disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 79.

89. A method of treating a condition in a subject selected from eating disorders,

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90. A method of treating a condition in a subject selected from eating disorders, seizure disorders, blood pressure disorders, locomotor disorders and anxiety disorders, which comprises administering to the subject a therapeutically effective amount of a composition comprising a compound identified as modulating the activity of an NPY receptor by carrying out the assay of claim 81.